Airborne Geophysical and Geological Mineral Inventory **FY2008 Request: $850,000**
Reference No: AMD6852

AP/AL: Appropriation
Project Type: Planning
Category: Natural Resources
Location: Statewide
Contact: Nico Bus
House District: Statewide
Contact Phone: (907)465-2406
Estimated Project Dates: 07/01/2007 - 06/30/2009

Brief Summary and Statement of Need:
The Airborne Geophysical and Geological Mineral inventory project is a special multi-year investment to expand the knowledge base of Alaska's mineral resources and catalyze private-sector mineral development. The project seeks to delineate mineral zones on Alaskan state lands that: (1) have major economic potential; (2) can be developed in the short term to provide high quality jobs for Alaskans; and (3) will provide economic diversification beyond oil and gas. Mineral resources compose significant economic assets, yet the location and magnitude of these resources are largely unknown.

Funding:	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	Total
Gen Fund	$850,000	$850,000	$850,000	$850,000	$850,000	$850,000	$5,100,000
Total:	$850,000	$850,000	$850,000	$850,000	$850,000	$850,000	$5,100,000

☐ State Match Required ☐ One-Time Project ☐ Phased - new ☐ Phased - underway ☑ On-Going
0% = Minimum State Match % Required ☑ Amendment ☐ Mental Health Bill

Operating & Maintenance Costs:

	Amount	Staff
Project Development:	0	0
Ongoing Operating:	0	0
One-Time Startup:	0	
Totals:	0	0

Additional Information / Prior Funding History:
See detailed project description for prior funding history.

Project Description/Justification:
Mineral resources comprise a major part of Alaska's economic assets. The location and magnitude of these resources are largely unknown, yet that knowledge is key to orderly development of the State and maintenance of a stable economy. Experienced mineral exploration managers have characterized Alaska's present state of mineral development as analogous to that of the entire group of states west of the Rocky Mountains in the late 1800s. At that time a few major ore bodies had been found and prospectors had located hundreds of prospects but none of that region's scores of subsequent world-class mines had been discovered. Alaska is like that. We, however, have the opportunity, capital, and technology to expedite discovery if we so choose.

Alaskans cannot efficiently manage or develop assets that are unknown and not quantified. The present lack of geologic knowledge is a formidable impediment to long-range planning for both industry and the state. The lack of resource knowledge discourages private-sector investment in Alaska, and instead favors capital allocation to other areas of the world where comprehensive assessments exist or are being actively generated. Major mining companies rely on government-supplied exploration scale (1:63,360) geological, geophysical, and geochemical maps to design and implement their programs. They expect at least this level of effort from any government that seriously desires a mineral industry. Products and applications of a thorough resource information base include: 1) Enhancing community and local government economies and revenue opportunities; 2) Stimulating private-sector exploration and competitive development of Alaska's mineral resources; 3) Developing transportation corridors and infrastructures, which always requires cost justification based on prior knowledge of resources; and 4) Developing long-term decisions on management of state-interest lands.

The Airborne Geophysical and Geological Mineral Inventory Project is congruent with the statutory mission of DGGS to: "Conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals,

[fuels, and geothermal resources]…" (AS 41.08.020). The current yearly Performance Measures for DGGS's mission to "Produce reliable new minerals-related geological and geophysical information" are to complete: "geophysical mineral surveys of 750 square miles" and "minerals-related bedrock geologic mapping of 240 square miles."

This project uses the most effective, practical, and efficient methods that exist for acquiring geologic data. Alternative approaches considered to encourage mineral exploration include the following:

1. Sole reliance on satellite or remote sensing imagery. Rejected because of inability to look beneath extensive ground cover and to provide unambiguous methodology for detecting subsurface mineralization, as well as low resolution. These techniques have recently been investigated by DGGS on other projects, and though useful for many items, do not work well for bedrock mineral exploration in Alaska.
2. Sole reliance on currently available data. Rejected because of general lack and quality of geologic data. Only about 15 percent of Alaska has adequate geological mapping; almost none has detailed geophysical surveys.
3. Sole reliance on ground-based field investigations. Rejected because of protracted time necessary for such an approach (decades and because it provides no subsurface information. Time and expense is greatly increased and the quality of maps produced without geophysical data is almost always severely limited.
4. Sole reliance on airborne geophysical methods. Rejected because geophysical anomalies alone cannot be interpreted without geological and geochemical control.

Our integrated approach, with detailed airborne geophysical surveys and ground-based geological and geochemical investigations of high priority areas, allows the inventory to be completed in an acceptable time and aids in discrimination between barren and resource-prone terranes.

The project has been successful in catalyzing private sector investment and job generation at a level that far surpasses the cost of conducting the surveys. This project has led mineral exploration companies, both major and junior mining companies, to spend multimillion to tens of millions dollars in areas across Alaska. These companies have consistently praised the program as to the high quality of the products and the timeliness of the data. Jobs for the Alaskan public are created both as a direct result of the project's execution and as a result of the knowledge generated during the project about Alaska's mineral resources. During execution of the project immediate jobs are created in the private sector; about 90% of a $850,000 CIP allocation goes to the private sector in the form of geophysical, helicopter, logistical, lodging, analytical, and various small contracts. Jobs are also generated in the private sector from the typical increase in the amount of exploration dollars spent and in the number of mining claims staked.

The true economic benefits in terms of job generation or revenue for the State of this project are impossible to predict. Although mineral development is a high-risk enterprise, there is a good probability that several of the prospects identified with the help of data generated by this project will become major mines and thus return the amount of the State's data generation investment a hundred fold. A similar investment in geologic knowledge in 1982 contributed to the ultimate development of the Fort Knox gold mine near Fairbanks. Fort Knox Mine has a workforce of 411, creates $107 million annually in local purchases, and creates 300 indirect jobs in the area. About $4.4 million of local property taxes are generated annually by the mine and its employees since 1997. Average residential electricity rates in the area have been reduced by about 7 percent because of the mine. These economic benefits to Fairbanks and Alaska are currently estimated to last 14 to 16 total years. Similar economic benefits for Fairbanks and Delta Junction are expected after development of Pogo Mine at a capital cost of more than $347 million, with gold production beginning in 2006, projected mine life of 10 years, and high potential for additional gold resources in surrounding prospects.

Why is this Project Needed Now:

The Airborne Geophysical and Geological Mineral Inventory Project encourages resource development, creates Alaska jobs, and helps provide revenue to the State and municipalities. This project is the most cost-effective method for State government to increase geologic knowledge that will aid the mining industry and enable planning for resource development planning and management. This is a strategic and effective investment in a program that aids in identifying mineral resources valued at contributing $13.5 billion to the state's economy from 1994 to 2005 and over $37.4 million dollars in direct revenue to the State and municipalities for items like mining license fees, royalties and rents in 2005. More than 2,800 people were employed in the mineral industry in Alaska in 2005 at an estimated job value of $194 million. If indirect and mining support jobs are added in, a total of 6,345 people were employed in Alaska during 2005 due to the mining industry with an estimated payroll of $457 million. It takes years to explore, identify, investigate, permit, and develop mineral resources. Without further exploration and discoveries, the amount of money generated by the mineral industry in the State and the number of jobs will significantly decline. Products from this project allow the state to look beyond the short-term rise and fall of commodity markets in formulating mineral-resource policies and in responding to related issues, such as land trades, corridor development, and area plans.

Specific Spending Detail:

Contingent upon funding levels, DGGS proposes to conduct airborne geophysical surveys in FY08 in one or more of the following areas:

1) Mt. Estelle-Hartman River, Skwentna (southcentral),
2) East Nome (Seward Peninsula,
3) Haines (Southeast)
4) Mentasta/Slana (southern), and
5) Willow (southcentral) .

Products resulting from the project would include 1:63,360-scale (inch-to-a-mile)
1) aeromagnetic and airborne-electromagnetic maps,
2) bedrock and surficial geologic maps, and
3) various other supporting data compilations, such as geochemistry.

Cost of the geophysical surveys varies depending on each tract's size, location, and bid responses from geophysical services vendors. In the past, geophysical and geological surveys of single minimal but reasonably sized tracts have required about $500,000 in CIP funds, augmented by Federal Receipts and General Funds from the operating budget. Due to increases in helicopter costs during the past five years, the cost of both the geophysical surveys and the geologic field projects has significantly increased. Because of this cost increase, $850,000 in CIP funds is requested for FY08. Approximately 30 percent of a $850,000 CIP allocation would be designated as a state match for federal funds within the federal STATEMAP National Cooperative Geologic Mapping Program, further increasing the amount of money that goes into the private sector in the manner of helicopter contracts and field logistics. No new positions are created as a result of this project.

Line Item Expenditures

Personal Services	$ 80.0
Travel	$ 10.0
Services	$753.0
Commodities	$ 7.0
Capital Outlay	$ 0.0

Project Support:

Local communities, Native corporations, private resource industry, Alaska Minerals Commission, Alaska Miners Association, regional borough governments, Department of Commerce, Community, & Economic Development, and Department of Natural Resources support the project. Three surveys were conducted in cooperation with the Bering Straits Native Corporation and Sitnasuak Village Corporation, Calista Native Corporation and Doyon Native Corporation. As owners of large tracts of land intermingled with state lands, they contributed various combinations of services, private geoscience data files, and funding to support the surveys.

Prior Funding History and Status:

Started in 1992, the project was designed to systematically acquire geophysical, and where necessary, ground-based geological data for about 40 million acres of state-owned uplands having high perceived mineral potential. The purpose and goals of this program have not changed. Candidate lands for this project have been identified on the basis of existing geologic knowledge, land ownership, and responses to solicitations for nominations from Alaska's mineral industry and Native regional corporations. To date 6.5 million acres of state-owned lands have been surveyed. Table 1 lists previous appropriations for the project.

Table 1: Previous appropriations

Fiscal year	Amount	Citation
FY07	$600,000	SLA06 CH82
FY06	$700,000	SLA05 CH03
FY05	$200,000	SLA04 CH159
FY04	$100,000	SLA03 CH82
FY03	$500,000	SSSLA02 CH1
FY02	$250,000	SLA01 CH61
FY01	$250,000	SLA00 CH135
FY00	$400,000	SLA99 CH2

Table 1: Previous appropriations, cont.

Fiscal year	Amount	Citation
FY99	$500,000	SLA98 CH139
FY98	$500,000	SLA97 CH50
FY97	$600,000	SLA96 CH123
FY96	$200,000	SLA95 CH103
FY95	$600,000	SLA94 CH4
FY94	$750,000	SLA93 CH79
FY93	$450,000	SLA92 CH5

Through this project, geophysical surveys have been conducted in summer and fall; and have been released to the public the following winter or spring. The geophysical data are of limited effectiveness unless good geologic data are available

to guide analysis and interpretation of the geophysics. If existing geologic data are inadequate, at least one additional year of ground-based field studies is needed to complete a project after geophysical surveying. To date geophysical surveys of some of the highest mineral potential tracts within 20 of 51 candidate areas have been completed (Table 2) . During FY06 and early FY07, a geologic map for the Liberty Bell area was prepared and published. The current field-geologic mapping project, near Council, will be released in early FY08. Field-geologic mapping for northeastern Fairbanks will start in FY07. Previously authorized CIP funds are designated to support these geological field activities and to be used to update formatting for older geophysical data.

Table 2. Status of work on previous and current geophysical and geological survey areas of mining districts.

Areas	Geophysical data	Field geologic mapping
Fairbanks, Nome west, Circle, Rampart/Manley, Chulitna, Petersville	Completed	Completed
Fortymile, Livengood, Salcha River/N. Pogo, Liberty Bell, Iron Creek	Completed	All scheduled completed
Ruby, Valdez Creek, Richardson	Completed	Entire or partial geologic mapping available
Council	Completed	268 sq miles completed; 300 sq miles in progress
NE Fairbanks, E. Richardson-Black Mountain, Broad Pass, Nyac,	Completed	NE Fairbanks will be initiated in FY07
E Bonnifield	In progress	